



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:) Attorney Docket No. 911568635006
Jan Andersson)
Application No.: 09/381,899)
Filed: December 16, 1999)
For: METHOD AND APPARATUS)
FOR AUTOMATIC DATA)
ACQUISITION OF FORMS)
Examiner: Bashore, William L.)
Art Unit: 2176)
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AMENDMENTS TO THE CLAIMS

Claim 1 (Cancelled)

Claim 2 (Previously Presented) The method according to claim 41, including :
generating an object area list having pictorial content contained in a presented
document.

Claim 3 (Cancelled)

Claim 4 (Previously Presented) The method according to claim 41, including:
automatically generating a line map comprising vertical and horizontal line
elements representing text, pictorial and color content, if all are present, on said presented
document.

Claim 5 (Previously Presented) The method according to claim 4, including:
automatically generating a horizontal key using horizontal line elements in said
line map by dividing automatically said presented document into a predetermined number of

horizontal segments along a y-axis in a cartographic system of coordinates, wherein each segment is equivalent to one horizontal key position; and

automatically generating a vertical key using vertical line elements in said line map by dividing automatically said presented document into a predetermined number of vertical segments along an x-axis in said cartographic system of coordinates, wherein each segment is equivalent to one vertical key position.

Claim 6 (Cancelled)

Claim 7 (Cancelled)

Claim 8 (Previously Presented) The method according to claim 5, wherein:

said horizontal key and/or said vertical key constitute a line key in the line map, and wherein during said automatic searching and comparing step, key positions generated are automatically compared with key positions stored in document maps in said computer system, said form maps.

Claim 9 (Previously Presented) The method according to claim 8, including :

automatically generating key positions by a number of markings; and
automatically sorting line keys according to the number of markings.

Claim 10 (Previously Presented) The method according to claim 2, wherein:

an object's horizontal position in said object area list is used to automatically generate a horizontal key by automatically dividing the presented document into a predetermined number of horizontal segments along a y-axis in a cartographic system of coordinates, wherein each segment is equivalent to one horizontal key position; and

an object's vertical position in said object area list is used to automatically generate a vertical key by automatically dividing the presented document into a predetermined

number of vertical segments along an x-axis in said cartographic system of coordinates, wherein each segment is equivalent to one vertical key position.

Claim 11 (Cancelled)

Claim 12 (Cancelled)

Claim 13 (Previously Presented) The method according to claim 10, wherein:

a horizontal key position and/or a vertical key position constitute an object key in said object area list, wherein during said automatic searching and comparing step, an object key generated is automatically compared with object keys stored in said form maps storage device.

Claim 14 (Previously Presented) The method according to claim 13, wherein:

said object key is generated by a number of markings; and

said object key is sorted according to said number of markings.

Claim 15 (Previously Presented) The method according to claim 41, wherein:

the automatic searching and comparing step results in a pre-defined number of candidates for identity with the presented document; and

manually identifying said presented document if several identity candidates are found as probabilities according to a factor of merit.

Claim 16 (Cancelled)

Claim 17 (Cancelled)

Claim 18 (Cancelled)

Claim 19 (Previously Presented) The apparatus according to claim 45 wherein:

said automatically generated map includes an object area list generated by pictorial and color content contained in said received document.

Claim 20 (Cancelled)

Claim 21 (Previously Presented) The apparatus according to claim 45 , wherein:

said automatically generated map includes a line map automatically generated by line elements on said received document.

Claim 22 (Previously Presented) The apparatus according to claim 21, wherein:

horizontal lines in said line map are used to automatically generate a horizontal key by automatically dividing said received document into a predetermined number of horizontal segments along a y-axis in a cartographic system of coordinates, wherein each segment is equivalent to one horizontal key position; and

vertical lines in said line map are used to automatically generate a vertical key by automatically dividing said received document into a predetermined number of vertical segments along an x-axis in said cartographic system of coordinates, wherein each segment is equivalent to one vertical key position.

Claim 23 (Cancelled)

Claim 24 (Cancelled)

Claim 25 (Previously Presented) The apparatus according to claim 22, wherein:

a horizontal key and a vertical key constitute a line key in said line map, and during searching, the line key automatically generated is automatically compared with line keys stored in said computer system.

Claim 26 (Previously Presented) The apparatus according to claim 25, wherein:

line keys are automatically sorted in the computer system according to a number of markings.

Claim 27 (Previously Presented) The apparatus according to claim 45, wherein:

a horizontal position of a pictorial content in the received document in an object area list is used to automatically generate a horizontal key by automatically dividing the received document into a predetermined number of horizontal segments along a y-axis in a cartographic system of coordinates, wherein each segment is equivalent to one horizontal key position; and

a vertical position of a pictorial content in the received document in the object area list is used to automatically generate a vertical key by automatically dividing the received document into a predetermined number of vertical segments along an x-axis in said cartographic system of coordinates, wherein each segment is equivalent to one vertical key position.

Claim 28 (Cancelled)

Claim 29 (Cancelled)

Claim 30 (Previously Presented) The apparatus according to claim 27, wherein:

a horizontal key position and/or a vertical key position constitute an object key in said object area list, wherein during searching, the object key automatically generated is automatically compared with object keys stored in said computer system.

Claim 31 (Previously Presented) The apparatus according to claim 30, wherein:

said automatically generated object keys are translated to a number of markings;
and

said object keys are automatically sorted in the computer system according to said number of markings.

Claim 32 (Previously Presented) The apparatus according to claim 45, wherein:

said computer system automatically provides a pre-defined number of probable candidates from automatically searching stored maps for identification automatically generated from said received documents; and including

a manual input apparatus as part of said computer system for providing identification content of said selected received documents.

Claim 33 (Cancelled)

Claim 34 (Cancelled)

Claim 35 (Cancelled)

Claim 36 (Cancelled)

Claim 37 (Cancelled)

Claim 38 (Cancelled)

Claim 39 (Cancelled)

Claim 40 (Cancelled)

Claim 41 (Previously Presented) A method for data acquisition comprising the steps of:

providing a computer system having document input, map generation, data storage, data searching, data comparing and data identification capabilities;

presenting a plurality of documents to said computer system, said plurality of documents having a variety of formats not predefined for said computer system and containing data content in locations not predefined for said computer system;

automatically generating in said computer system a map of each presented document of said plurality of presented documents;

automatically searching in said computer system for stored document maps;
comparing in said computer system each map of each presented document of said plurality of presented documents with all document maps previously stored; and
either automatically storing in said computer system document maps of presented documents of said plurality of presented documents that do not coincide according to predetermined limits for agreement with any document map previously stored in said computer system, or automatically identifying presented documents of said plurality of presented documents where there is agreement between document maps of such presented documents according to said predetermined limits for agreement with document maps previously stored in said computer system, said automatically storing step of document maps of presented documents of said plurality of presented documents that do not coincide according to predetermined limits for agreement with any document map previously stored in said computer system occurring as each document map fails to be identified according to predetermined limits for agreement.

Claim 42 (Previously Presented) The method of claim 41 wherein:

said stored document maps forms a knowledge data base.

Claim 43 (Previously Presented) The method of claim 41 wherein:

each of said document maps includes document characteristics.

Claim 44 (Previously Presented) The method of claim 43 wherein:

said document characteristics includes line maps, horizontal lines, vertical lines, horizontal keys, vertical keys, line keys and numbers of markings.

Claim 45 (Previously Presented) An apparatus for data acquisition comprising:

a computer system having adaptive recognition capability and also having structure to automatically receive, generate, store, search and compare data from a plurality of

received documents having a variety of formats not predefined for said computer system and containing data content in locations not predefined for said computer system and wherein;

said computer system receives a plurality of documents having a variety of formats not predefined;

said computer system has structure to automatically generate a map of each received document of said plurality of received documents;

said computer system has structure to automatically search document maps previously stored;

said computer system has structure to automatically compare each map of a received document of said plurality of received documents with stored maps;

said computer system has structure either to indicate recognition of a map or to indicate a lack of recognition of such map; and

when there is a lack of recognition, said computer system has structure to automatically store such unrecognized maps as each of said unrecognized maps fails to be identified according to predetermined limits for agreement.

Claim 46 (Previously Presented) The apparatus of claim 45 wherein:

said stored document maps form a knowledge data base.

Claim 47 (Previously Presented) The apparatus of claim 45 wherein:

each of said document maps includes document characteristics.

Claim 48 (Previously Presented) The apparatus of claim 47 wherein:

said document characteristics include line maps, horizontal lines, vertical lines, horizontal keys, vertical keys, line keys and numbers of markings.

Claim 49 (Previously Presented) A computer program product, embodied in a computer-readable medium for operating a computer system comprising the steps of:

causing said computer system to receive a plurality of documents unknown to said computer system, said plurality of documents having a variety of formats including text, lines, pictorial images and color and having data content in a variety of locations, said formats and said locations not predefined for said computer system;

causing said computer system to generate a map of each received document of said plurality of received documents without manual input;

causing said computer system to search document maps previously stored, if any, in said computer system;

causing said computer system to compare each document map generated with document maps previously store, if any;

causing said computer system either to identify each of said document maps generated or to store those generated document maps not identified as each of such generated document maps fails to be identified; and

thereafter causing said computer system to continue acquisition of data content from said received documents.

Claim 50 (Previously Presented) A method for storing data from data containing documents comprising the steps of:

providing a data processing apparatus;

processing data containing documents who identity is unknown by said data processing apparatus;

automatically searching stored identities derived from previously processed documents made during processing; and

either automatically making identification and thereafter automatically reading and storing data from such identified processing document or automatically storing an identification of such processing document and thereafter automatically reading and storing data from such document.

Claim 51 (Previously Presented) A method for storing data from data containing documents comprising the steps of:

providing a data processing apparatus;

providing to said data processing apparatus a plurality of data containing documents of unknown identity for processing in the absence of any inputted templates for identifying said plurality of documents before processing;

automatically identifying said plurality of documents; and

automatically reading and storing data from said plurality of data containing documents in the absence of preprocessing inputted data location information.

Claim 52 (Previously Presented) The method of claim 51 wherein:

the automatically identifying step comprises comparing each of said plurality of data containing documents of unknown identity with previously processed documents and either identifying such document or automatically storing an identification of such processing document in the absence of operator intervention during processing.

Claim 53 (Previously Presented) A method for processing documents to determine document identity comprising the steps of:

providing a data processing apparatus;

providing to said data processing apparatus a plurality of documents of unknown identity for processing in the absence of any inputted templates for identifying said plurality of documents before processing and in the absence of fixed forms; and

automatically identifying said plurality of documents.

Claim 54 (Previously Presented) An apparatus for storing data from data containing documents processed by said apparatus comprising:

a data input structure, a data search structure connected to said data input structure, a document reading structure connected to said data search structure, and a data storage structure connected to said document reading structure, said data storage structure including identification data derived from previously processed data containing documents wherein the identity of a presently processing document is automatically compared to the identities of the previously processed data containing documents and a match is found, or if no match is found, the identity of the presently processing document is automatically added to the data storage structure;

after identification, said reading structure reads data from the presently processed data containing document; and

after the data reading, said data storage structure stores the read data.

Claim 55 (New) A method for acquiring data from a plurality of processing documents comprising the steps of:

providing a data processing apparatus;

processing a plurality of data containing documents in said data processing apparatus in the absence of preprocessing templates and in the absence of a requirement that said plurality of data containing documents be created in a predetermined format; and

either adaptively identifying documents from said plurality of documents and storing the identification of such documents in said data processing apparatus, and thereafter reading and storing data from such documents in said data processing apparatus, or adaptively identifying documents from said plurality of documents in said data processing apparatus and recognizing said identified documents and thereafter reading and storing data from said identified document in said data processing apparatus.